ago by the solid-stem type of thermometer had it not been for the fact that it is nearly impossible to make clear fine divisions on the kind of glass of which these thermometers are usually made. The sensitiveness, length of degree, size of bulb, &c., of thermometers for calorimetric purposes are dealt with in detail, the authors' conclusions being closely in accord with the recommendations of the Bureau International des Poids et Mésures.

The chapter dealing with the "cooling correction" is specially valuable, particularly the clearly described way of graphically applying the Regnault-Pfaundler method.

In the chapter on specific-heat determination, Prof. Louguinine's tramway calorimeter is described. Details are given as to the curious fact, known to most who have worked at the subject, that it is extremely difficult in any form of vapour-heated vessel to arrange that the substance to be heated really reaches the temperature of the heating vapour employed, even if this be a vapour like steam, with a relatively enormous latent heat. A list of suitable substances for attaining various steady temperatures is also given.

An interesting chapter by Prof. Schukarew deals with some modifications of the Joly calorimeter, presenting some obvious advantages and giving increased precision.

In conclusion, we may say that the book is well got up, and the illustrations are numerous and excellent. A fault, however, is the large number of misprints and errata, many of which are not corrected in the list given at the end. It is startling to find many proper names, some those of leading authorities in the domain of heat—such as Bunsen, Velten, Callendar, Plattner, Wiedemann, Walferdin, Griffiths, and Dieterici—mis-spelt time after time.

J. A. HARKER.

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## TROPICAL AGRICULTURE.

*Southern Agriculture.* By F. S. Earle. Pp. vi+297. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1908.) Price 5*s*. net.

FOR many years there was a noteworthy dearth of books in English dealing generally with agricultural methods in the tropics and subtropics, and affording a concise summary of our knowledge of the plants of those regions. The information, it is true, was available in published form, but scattered in handbooks and pamphlets on particular plants and subjects, or buried in the files of numerous botanical and agricultural journals, so that those not actually engaged in the subject often found considerable and at times insuperable difficulties in obtaining a good, practical account of, for example, the principal fruits or the fibre-producing plants of warm countries.

To the still comparatively small series of books which supply such information, "Southern Agriculture," by F. S. Earle, is the latest addition. It does not profess to cover the whole range of tropical agriculture—which, indeed, would not be practicable in a volume of its size—but it so happens that the conditions in the southern States and the American possessions in the West Indies are so diverse, ranging from normal and arid subtropical regions to the thoroughly tropical West Indian islands, that the book will prove of utility to a much wider circle than those immediately interested in the area with which it specifically deals. This is particularly marked in the first part of the book, entitled "General Considerations." Here Mr. Earle has given us the benefit of his experience in various lands, and in dealing, for instance, with such subjects as irrigation he brings out well the principles underlying practice in countries possessing very different conditions, explains how irrigation may be of value in humid as well as in dry countries, and gives useful descriptions of the methods in vogue in various districts. Other sections in this part which should be of wide interest are those relating to the improvement of the soil, marketing products, farm policy and management, and plant diseases. The division of plant diseases into three general groups—environmental, functional, and diseases due to parasites—and the clear discussion of the methods of dealing with each group will serve to illustrate the successful attempt to make the work more than a mere compilation of facts.

The second part, "The Chief Southern Agricultural Crops," is somewhat unequal in its treatment, but this is apparently in the main intentional, and is correlated with the relative local importance of the plants. Sugar-cane, the cereals, pasture and forage crops, tobacco, cotton, and, in particular, the fruits, are dealt with at considerable length, an account being given, not only of their botanical identity and mode of cultivation, but also of their principal pests, both insect and fungoid. Coffee and cacao are less fully treated, the large group of vegetables are disposed of in a few pages under the name of "Truck Crops," and a few notes on forestry and domestic animals conclude the volume.

The book contains the best account available, within small compass, of the agriculture of the warmer regions of North America and the West Indies, and, as already indicated, has in addition many features which will ensure it being of use also in other parts of the world.

W. G. FREEMAN.

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## ANALYTICAL CHEMISTRY.

*Qualitative Analyse vom Standpunkte der Ionenlehre.* By Dr. Wilhelm Böttger. Second, revised and greatly enlarged edition. Pp. xvi+524. (Leipzig: Wilhelm Engelmann, 1908.) Price 10 marks.

IN the second edition of this book, which made its first appearance in 1902, the author has made very considerable additions, resulting in an approximate doubling of the original size. As the title indicates, it is written from the point of view of the theory of electrolytic dissociation. This fact, in itself, may be sufficient to condemn the book in the opinion of the chemists of the anti-ionic school, but there can be no doubt that the basis furnished by the ionic theory is the one which at present must be recognised as meeting with the approval of the great majority of scientific chemists.

The arrangement of the subject-matter is such that

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the chapters dealing with general questions and those treating of special matters are separated from one another. There are five sections, of which the first deals with the fundamental conceptions and relationships which are of importance in connection with the scientific study of analytical chemistry. Simple experiments to illustrate the difference between strong, weak, and non-electrolytes, the influence of mass in chemical change, the changes in the properties of acids and bases on the addition of their salts, the formation of complex ions, the difference between double salts and complex salts, are described among others. In the opinion of the reviewer, these preliminary exercises form the very best foundation of any attempt to build up a system of instruction in analytical chemistry which is to have an educational value and provide a mental stimulus for the student.

In the second section the usual instructions for the carrying out of the many operations incidental to analytical work are given. The third is devoted to characteristic reactions of cations and anions, which are arranged in the usual groups, and in the fourth section the processes of qualitative analytical separation are dealt with. In the fifth, the reactions serving for the recognition of the rarer elements are grouped together, and a detachable booklet contains tables for laboratory use.

The text throughout affords evidence of the author's familiarity with the recent literature bearing upon the constitution of aqueous solutions, a knowledge of which is of essential importance for the proper interpretation of the reactions which serve as the basis of analytical work.

The systematic presentation of the subject in terms of the ionic theory and the use of ionic equations may possibly present certain difficulties to the student, but the fact that greater demands are made upon the mental capacity is not without its compensations. At the same time, experience has shown that many reputed difficulties are more imaginary than real, and if, as is undoubtedly desirable, the study of analytical chemistry in the universities and polytechnics is not commenced until the second year of the student's course, Böttger's work will no doubt be adopted by many teachers who desire to eliminate from their courses the unsatisfactory features characteristic of many types of so-called guides to qualitative analysis.

In the interests of English students, it is hoped that the appearance of an English translation of the second edition of the book will not be long delayed.

H. M. D.

## OUR BOOK SHELF.

*The A.D. Infinitum Calendar.* (Liverpool: Collin and Irene.)

WE presume that the title of the above is intended for a sort of pun, and that the A.D. may be written as in the heading with dots, or as below when we are told that it is available for any year from A.D. 1 *ad infinitum,* where the *ad* is taken as a Latin preposition.

We have had many perpetual calendars brought before us, but this is perhaps the most ingeniously contrived for giving by inspection and the adding together of four small numbers (none exceeding six, so that it is easily done in the head) the day of the week corresponding to any day of the year. As a specimen we may take the day on which we are writing, *i.e.* November 18, 1908. For the tens of centuries (19) we take out the number 5; for the number in the century (08,* marked with an asterisk because it is a leap-year) we have 3; for the month November 6; and for the 18th day of it 4. Then by adding 5+3+6+4 we obtain 18, which gives Wednesday in the last column for the day of the week. In the second column (for months called A) January and February are inserted twice, for common years or leap-years, the latter being marked with an asterisk.

As the calendar stands, it will serve until the year 3099, which will do for a *few* generations; but the authors naïvely add that it can easily be extended to go on to the end of time. A caution is perhaps necessary owing to its being so often forgotten that the alteration of the style (on the Continent in 1582 and in England in 1752) effected a two-fold change. The mere altering the rule for observance of leap-year only necessitated a slight shift, easily allowed for in a table. But the dropping of ten days from the Julian to the Gregorian reckoning, which became eleven in the eighteenth century and is now thirteen, was a different matter. Neither the calendar before us nor any similar one can give the days of the week correctly by the Julian reckoning of the days of the month after the change of style, the days of the week agreeing, but those of the month disagreeing by a number which is not a multiple of 7.

W. T. L.

*The Extra Pharmacopoeia of Martindale and Westcott.* Revised by Dr. W. Harrison Martindale and W. Wynn Westcott. Thirteenth edition. Pp. xl+1164. (London: H. K. Lewis, 1908.) Price 10*s.* 6*d.* net.

THIS new edition of Martindale and Westcott's "Extra Pharmacopœia" contains an enormous amount of matter in a small compass, and although 1164 pages in length, 124 pages more than the last edition, by the use of thin paper it remains a volume that can easily be carried in the pocket. In addition to the preparation of our own and of many foreign pharmacopœias, a large number of other drugs and proprietary substances are included, together with tables of atomic weights, weights and measures, tests and solubilities. Of the supplementary matter, arsenical contamination receives special attention, the section on radiography has been brought up to date, "nutrimenta" are considered in a special chapter, in which the work of Fischer on the structure of the protein molecule and the new nomenclature of protein substances receive notice; and serum and vaccine therapy is fully discussed. The elements of bacteriology, opsonins, and the determination of the opsonic index, references to cerebro-spinal meningitis, trypanosomiasis, the *Treponema pallidum* of syphilis, the transmission of Mediterranean fever by goats' milk, the use of tuberculins, Calmette's ophthalmic reaction in tuberculosis, and organotherapy all are considered.

Chapters on mineral waters, analytical memoranda, including electrical conductivity, and a therapeutic index are included. Glossaries of words and phrases likely to occur as directions in foreign prescriptions are given in several languages, and should prove very useful. The index is very full and complete, and the composition of a number of patent medicines is given. The book is emphatically one which no medical practitioner or pharmacist can do without, and it should find a place in the library of every laboratory, for it contains data that may be of service in almost every branch of science.

R. T. H.

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